



## Department of Energy

### Idaho Operations Office

1955 Fremont Avenue  
Idaho Falls, ID 83415

**SUBJECT:** U.S. DEPARTMENT OF ENERGY PROPOSED FINDING OF NO SIGNIFICANT IMPACT FOR THE ENVIRONMENTAL ASSESSMENT FOR THE MICROREACTOR APPLICATIONS RESEARCH, VALIDATION AND EVALUATION PROJECT AT IDAHO NATIONAL LABORATORY (CLN211013)

**Agency:** U.S. Department of Energy (DOE)

**Action:** Proposed Finding of No Significant Impact (FONSI)

**Summary:** The U.S. Department of Energy (DOE) prepared an Environmental Assessment (EA) to evaluate potential impacts of design and demonstration of the Microreactor Applications Research Validation and Evaluation Project (MARVEL) reactor at the north high bay of Idaho National Laboratory's (INL) Transient Reactor Test (TREAT) Reactor Building. The MARVEL reactor will have a power level of about 20-kW electric (kW<sub>e</sub>) and is a sodium cooled, High-Assay Low-Enriched Uranium thermal reactor design, utilizing Stirling engines to generate power.

A "no action" alternative analysis was performed on the MARVEL reactor in the EA. Under this analysis, activities at the INL would continue with existing operations, and the MARVEL microreactor project would not be implemented. A no action alternative would not result in impacts to resources at the INL beyond those captured in the discussion of the affected environment. The environmental impacts of future activities at the INL Site would be evaluated in project or program specific analyses in compliance with the National Environmental Policy Act (NEPA).

In July 2020, the Council on Environmental Quality (CEQ) comprehensively updated its NEPA regulations, which went into effect on September 14, 2020. The CEQ clarified that these regulations apply to all NEPA processes begun after the effective date, but gave agencies the discretion to apply them to ongoing NEPA processes (85 Fed. Reg. 137, 2020). The EA for the MARVEL microreactor was started prior to the effective date of the revised CEQ regulations, and DOE has elected to complete the EA pursuant to the CEQ regulations at 40 CFR 1508.9(b) (1978, as amended 1986 and 2005).

**Analysis:** Based on the analyses in the EA, the proposed action will not significantly affect the human environment within the meaning of NEPA.

The term "significantly" and the significance criteria are defined by Council on Environmental Quality Regulations for implementing NEPA at 40 CFR 1508.27. The significance criteria relevant to the proposed action are addressed and the applicable corresponding analyses in the EA are referenced below.

**1.) Beneficial and adverse impacts [(40 CFR 1508.27 (b)(1))]:** Potential impacts to air quality, historical and cultural resources, ecological resources, soils, and public health and safety were analyzed. Analysis also addressed potential impacts related to hazardous materials and waste management, spent nuclear fuel, and intentionally destructive acts. The analyses demonstrated that there will be no significant impacts from implementing the proposed action.

**2.) Public health and safety [40 CFR 1508.27 (b)(2)]:** Potential impacts to public and worker health and safety from operations were analyzed. Potential impacts from noise, exposure to chemicals, and occupational injuries are and would continue to be regulated to protect human health. The proposed action is not anticipated to adversely affect worker or public health and safety.

**3.) Unique characteristics of the geographical area [40 CFR 1508.27 (b)(3)]:** The facility modifications and operations proposed as part of the proposed action would occur in existing facilities. The MARVEL microreactor does not require construction of new facilities or additional land use or ground disturbance. Therefore, the activity will not affect any unique characteristics of the area.

**4.) Degree to which effects on the quality of the human environment are likely to become highly controversial [40 CFR 1508.27 (b)(4)]:** DOE used state-of-the-art scientific methods, technology, and qualified experts to assure the accuracy and quality of the impacts analyses and to provide confidence in the results of this assessment. There are no substantive technical or scientific issues related to the proposed action that are not understood, quantified, and validated. Since the impacts to the quality of the human environment were determined to be minimal, DOE proposes a Finding of No Significant Impact.

**5.) Uncertain or unknown risks on the human environment [40 CFR 1508.27 (b)(5)]:** The risks associated with the proposed action are well-defined. Hazard evaluations are performed to support each phase of the MARVEL microreactor's design efforts. The hazard evaluation of MARVEL microreactor events and associated operations was performed for selection and evaluation of safety classification of structures, systems and components (SSCs), SSC safety functions, and design basis accidents applicable to the MARVEL microreactor design. This approach provides reasonable assurance of meeting the requirements for protection of the public, worker, and environment for the MARVEL microreactor design. All resource areas were screened and carefully analyzed before critical areas were identified for detailed analysis in the EA. All analyses used accepted methodologies and input values and were based on conservative assumptions to ensure the results adequately bounded the potential impacts to human health and the environment.

**6.) Precedent for future actions [40 CFR 1508.27 (b) (6)]:** The proposed action does not set a precedent for future action that may have significant effects or represent a decision in principle about a future consideration on the INL Site.

**7.) Cumulatively significant impacts [40 CFR 1508.27 (b) (7)]:** The calculated impacts to the critical resource areas from implementing the proposed action were individually insignificant. The additive impacts from implementing the proposed action to those manifested from past, ongoing or reasonably foreseeable future projects or programs on and adjacent to the INL were evaluated and also determined to be insignificant.

**8.) Effect on cultural or historic resources [40 CFR 1508.27 (b) (8)]:**

The MARVEL microreactor was reviewed for cultural and archeological impacts under section 106 of the National Historic Preservation Act (NHPA). Of the three historic properties present within the area of potential effect, modifications to meet the needs of the proposed action will occur only within the TREAT Reactor Building. The proposed use of the storage pit and indicated modifications to the TREAT Reactor Building are consistent with the ongoing research and development activities associated with science and engineering at INL. Placing and operating the MARVEL microreactor in proximity to the TREAT Reactor Building will not affect the historic property. Therefore, the proposed action will have no adverse effects to historic properties.

**9.) Effect on threatened or endangered species or critical habitat [40 CFR 1508.27 (b)(9)]:**

The analysis indicates no threatened or endangered species or critical habitat will be adversely impacted by the proposed action. Implementing the proposed action with identified controls will not result in any significant impacts.

**10.) Violation of Federal, State or local law [40 CFR 1508.27 (b) (10)]:** The analysis indicates implementing the proposed action will not violate federal, state, or local laws.

**Determination:** Based upon the analysis presented in the attached EA, I have determined that the proposed action would not significantly affect the quality of the human environment. Therefore, preparation of an Environmental Impact Statement is not required.

Issued at Idaho Falls, Idaho on this 7th day of June 2021.

**Robert D.  
Boston**

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Robert Boston  
Manager

Copies of the EA and FONSI are available from: Tim Jackson, Office of Communications, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208-526-8484.

For further information on the NEPA process contact: Jason Anderson, NEPA Compliance Officer, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208-526-0174.